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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/581,777

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Hiromitsu Tsuji

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HARNESS, DICKEY & PIERCE, P.L.C.  
P.O. BOX 828  
BLOOMFIELD HILLS, MI 48303

EXAMINER

THOMPSON RUMMEL, PONDER N

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

03/19/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/581,777	<b>Applicant(s)</b> TSUJI ET AL.	
	<b>Examiner</b> PONDER N. THOMPSON RUMMEL	<b>Art Unit</b> 1795	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 27 September 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

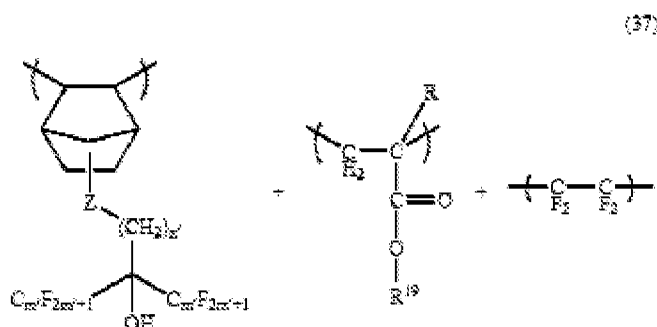
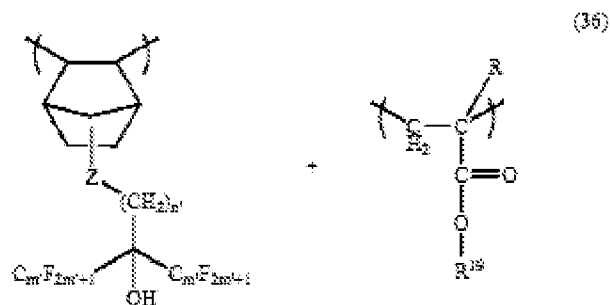
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al. (WO 2004079800 wherein citations are from US 2006/0154188 equivalent document) in view of Hada et al. (WO 2004108780 wherein citations are from US 2007/0065748 equivalent document).

With regards to claim 1-3, Hirayama et al. discloses a resin composition for use in an immersion lithography fluid that comprises:

A. a polymer of formulas (36) and (37) (paragraph [0142]) that comprises a fluorine atom or fluorinated alkyl group and an alcoholic hydroxyl group, such as an alcoholic hydroxyl group-containing fluoroalkyloxy groups and alcoholic hydroxyl group-containing fluoroalkyloxyalkyl groups (paragraphs [0135]-[0136]),

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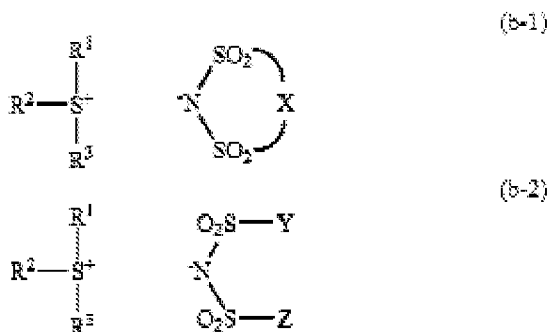


- that are bonded to an a cyclic group that forms the backbone (paragraph [0144]) wherein Z is an oxygen atom, oxymethylene group or single bond and n' and m' are integers from 1 to 5 (paragraph [0138] and [0142]);
- B. an acid-generating component which may be any know compound used in chemical amplication type resist (paragraph [0206]);
- C. a nitrogen-containing compound such as an alkanol amine compound (paragraph [0213]) for example, triethanolamine and diethanolamine (paragraph [0167]) and trimethylamine (a tertiary amine – paragraph [0167]); and
- D. an organic carboxylic acid such as malic acid, succinic acid, and benzoic acid (paragraph [0169]) or an oxo acid of phosphorus such as phosphoric acid, di-n-butylphosphate and diphenylphosphate (paragraph [0170]).

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Although Hirayama et al discloses the use of an acid-generating compound, Hirayama et al. failed to disclose the use of an acid-generating compound comprising an iminosulfonate structure as claimed by applicant in claim 1.

Hada et al. discloses photoresist compositions comprising an iminosulfonate acid generator component that is represented by formulas (b-1) and (b-2) (or sulfonium compounds 1 and sulfonium compounds 2, respectively – paragraph [0121]) that meets the limitations of the acid-generating agent set forth by applicant in claim 1.



In formulas (b-1) and (b-2), X represents a straight chain or branched alkylene grouping which at least one hydrogen atom has been substituted with a fluorine atom (paragraph [0122]),  $R^1$  to  $R^3$  each represent, independently, an aryl group or an alkyl group (paragraph [0125]), and Y and Z represent, independently, a straight-chained or branched alkyl group in which at least one hydrogen is substituted with a fluorine atom, and the number of carbon atoms is from preferably 1 to 7 (paragraph [0123]). By combining at least one of the sulfonium compounds (b-1) or (b-2) within the resist composition a defect reduction (such as scum and pattern abnormalities) effect is achieved (paragraph [0132]). The presence of a bulky iminosulfonate structure causes the diffusion length to shorten, thus providing higher resolution (paragraph [0132]).

It would have been obvious to one of ordinary skill within the art at the time of the invention to use an iminosulfonate acid generator taught by Hada et al. specifically acid generator (b-1) or (b-2) in the resist composition of Hirayama et al. to reduce defects such as scum and pattern abnormalities as well as increase the resolution of the patterned resist.

With respect to claims 4, Hirayama et al. discloses a method of forming a resist pattern comprising:

- A. Forming a photoresist film of the resist composition of claim 1 onto a substrate (paragraphs [0184] and [0185]);
- B. Selectively exposing the resist film (paragraph [0188]); and
- C. Heating the resist film (paragraph [0189]) and developing the resist film to form a resist pattern (paragraph [0190]).

3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ogata et al. (WO 2004088428 wherein citations are from US 2006/0166130) in view of Hada et al. (2004108780 wherein citations are from US 2007/0065748).

With regards to claims 1-3, Ogata et al. discloses a photoresist composition comprising:

- A. a polymer containing an alkali-soluble constituent unit consisting of an alicyclic group having both a fluorine atom or a fluorinated alkyl group and

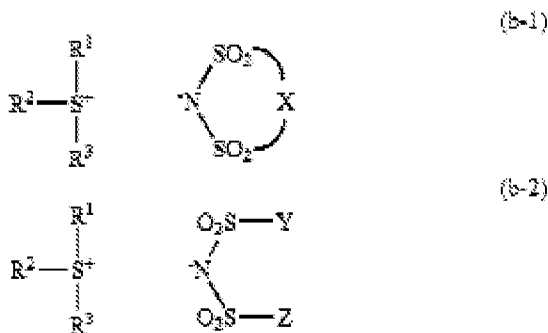
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- an alcoholic hydroxyl group wherein alkali solubility of the polymer is changed by action of an acid (paragraph [0042]);
- B. an acid-generating component which may be any known compound used in chemical amplification type resist (paragraph [0067]);
- C. a nitrogen-containing compound such as an alkanol amine compound (paragraph [0085]) for example, triethanolamine and triisopropanolamine (paragraph [0086]) and a tertiary alkylamine – paragraph [0085]; and
- D. an organic carboxylic acid such as malic acid, succinic acid, and benzoic acid (paragraph [0083]) or an oxo acid of phosphorus such as phosphoric acid, di-n-butylphosphate ester and diphenylphosphate ester (paragraph [0084]).

Although Ogata et al. discloses the use of an acid-generating compound, Ogata et al. failed to disclose the use of an acid-generating compound comprising an iminosulfonate structure as claimed by applicant in claim 1.

Hada et al. discloses photoresist compositions comprising an iminosulfonate acid generator component that is represented by formulas (b-1) and (b-2) (or sulfonium compounds 1 and sulfonium compounds 2, respectively – paragraph [0121]) that meets the limitations of the acid-generating agent set forth by applicant in claim 1.

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In formulas (b-1) and (b-2), X represents a straight chain or branched alkylene grouping which at least one hydrogen atom has been substituted with a fluorine atom (paragraph [0122]), R1 to R3 each represent, independently, an aryl group or an alkyl group (paragraph [0125]), and Y and Z represent, independently, a straight-chained or branched alkyl group in which at least one hydrogen is substituted with a fluorine atom, and the number of carbon atoms is from preferably 1 to 7 (paragraph [0123]). By combining at least one of the sulfonium compounds (b-1) or (b-2) within the resist composition a defect reduction (such as scum and pattern abnormalities) effect is achieved (paragraph [0132]). The presence of a bulky iminosulfonate structure causes the diffusion length to shorten, thus providing higher resolution (paragraph [0132]).

It would have been obvious to one of ordinary skill within the art at the time of the invention to use an iminosulfonate acid generator taught by Hada et al. specifically acid generator (b-1) or (b-2) in the resist composition of Ogata et al. to reduce defects such as scum and pattern abnormalities as well as increase the resolution of the patterned resist.



With respect to claims 4-5, Ogata et al. also discloses a method of forming a resist pattern comprising:

- A. applying the photoresist composition of claim 1 onto a substrate provided with an organic or inorganic anti-reflection film of SiON, SiN and Si<sub>3</sub>N<sub>4</sub> (paragraph [0103]), and drying to form a resist film (paragraphs [0101]);
- B. selectively exposing the resist film (paragraph [0188]); and
- C. heating the resist film (paragraph [0102]) and developing the resist film to form a resist pattern (paragraph [0102]).

### ***Response to Arguments***

4. Applicant's arguments filed September 27, 2007 have been fully considered but they are not persuasive.

5. Hirayama et al and Ogata et al disclose the photoresist of formulas (3), (4) and (5) of applicant's claim 1. Further, Hada et al discloses the use of the iminosulfonate acid generator. The acid generator is preferred to reduce pattern abnormalities after development (paragraph [0131]). It would have been obvious to one of ordinary skill within the art to use the acid generator of Hada et al within the resist composition of Hirayama and Ogata to improve line edge roughness characteristics and resolution (paragraph [0033]).

6. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention

where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Hirayama et al clearly discloses the polymer selected from formulas (36) and (37) which are exactly the same as applicant's formula (3) and (4) in claim 1. Further, Hirayama et al discloses that *any* known acid-generating agent that is conventionally used (paragraph [0158]). This statement clearly provides one of ordinary skill within the art to combine any type of acid generator used within a positive or negative resist. Therefore, one could use those that are listed within the examples or any other type of acid generator such as one provided by Hada et al.

7. In response to applicant's argument that Hada et al fail to describe or suggest the fluoropolymer, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981).

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PONDER N. THOMPSON RUMMEL whose telephone number is (571)272-9816. The examiner can normally be reached on Monday-Friday 7:00 am - 4:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on 571-272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/P. N. T./  
Examiner, Art Unit 1795

/Cynthia H Kelly/

Supervisory Patent Examiner, Art Unit 1795